Mathematics > Number Theory

A Diophantine problem with a prime and three squares of primes

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We prove that if λ_1, λ_2, λ_3 and λ_4 are non-zero real numbers, not all of the same sign, λ_1 / λ_2 is irrational, and ϖ is any real number then, for any $\eps > 0$ the inequality $ \bigl|\lambda_1 p_1 + \lambda_2 p_2^2 + \lambda_3 p_3^2 + \lambda_4 p_4^2 + \varpi \bigr| \le \bigl(\max_j p_j \bigr)^{-1 / 18 + \eps} $ has infinitely many solution in prime variables p_1, ..., p_4

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